APPENDIX B: SPILL PREVENTION RESOURCE GUIDE

Preface.

The following resource guide is a convenient source of relevant and practical information for personnel involved in the design, installation, operation, or maintenance of oil storage and transfer facilities.

The purpose of this recently developed document is to summarize pertinent information on oil spill prevention in one succinct resource guide. This document will assist owners and operators of petroleum sites in finding information quickly so that spill prevention measures can be met and/or put into place in a reasonable time. The document contains information on laws and regulations, federal documents, key elements of an SPCC Plan, industry standards, potential vendors for various tank devices, training, best practices, NFESC recommended practices, and Navy points of contact for oil spill prevention. The resource guide also provides numerous web site addresses for regulations and regulatory guidance, industry standards and standard setters, manufacturers and vendors of equipment and devices, and training resources and providers.

[Note that any vendors included in the document are not necessarily endorsed, nor should any listing of vendors be considered comprehensive. Also, web page addresses and other information are subject to change; for assistance on updates, please contact NFESC.]



NFESC SPILL PREVENTION RESOURCE GUIDE

ASHORE SPILL PREVENTION RESOURCE GUIDE



NFESC SPILL PREVENTION RESOURCE GUIDE

ASHORE SPILL PREVENTION RESOURCE GUIDE

EXECUTIVE SUMMARY

The purpose of this resource guide is to summarize all of the pertinent information to ashore oil spill prevention in one document. This guide is designed to assist owners and operators of petroleum sites to be able to find information quickly, so that spill prevention measures can be met and put into place in a reasonable time. The information in this document consists of Laws and Regulations, Federal Documents, Key elements of a Spill Prevention, Control, and Countermeasure Plan, Industry Standards, Potential Vendors for various Tank Devices, Training, Best Practices, NFESC Recommended Practices, and Points of Contact for Oil Spill Prevention. Please note that we do not necessarily endorse vendors listed, nor should any listing be considered comprehensive. This document provides a starting point to find information faster. Also, please note that links and information are subject to change. For assistance or updates, please contact NFESC at (805) 982-1887.



THE NAVIGATION HELPER BELOW IS YOUR TABLE OF CONTENTS.

This guide uses web-like hypertext links that is designed to function with computer viewing (not hardcopy reading).

NAVIGATION HELPER (click on a topic title in **RED** to go to that section)

FLASH TRAFFIC!!!	Critical information you probably need to know if you're using this document.
INTRODUCTION	Information on what the guide is about and how to use it.
FEDERAL REGULATIONS	A list of key Federal regulations on spill prevention, with web links to on-line documents and to related information.
FEDERAL DOCUMENTS	A list of key Navy, Marine Corps, EPA, and DESC documents on spill prevention, with web links to on-line documents.
ELEMENTS OF AN SPCC PLAN	A list of the key elements (e.g., secondary containment) of any SPCC plan.
INDUSTRY STANDARDS	A list of key industry standards applicable to POL facilities. Also information on accessing standards through a NAVFAC contract.
LEVEL SENSING	An introduction to level sensing devices and a list of web sites of major level sensing equipment manufacturers.
OVERFILL PREVENTION	An introduction to overfill prevention devices and a list of web sites of major overfill prevention equipment manufacturers.
LEAK DETECTION	An introduction to leak detection devices and a list of web sites of major leak detection equipment manufacturers.
GAS STATION DEVICES	An introduction to gas station devices and a list of web sites of major gas station equipment manufacturers.
LOADING RACK DEVICES	An introduction to loading rack devices and a list of web sites of major tank truck equipment manufacturers.
ADDITIONAL INFORMATION ON THE STATE OF THE ART	Information of relatively recent developments in the state of the art (e.g., catchment around fill inlets), and a list of web sites of some major tank standard-setters with information on the state of the art.
SPILL PREVENTION TRAINING (VIDEOS)	Information on videos available to train personnel on spill prevention.
SPILL PREVENTION TRAINING (OTHER)	A list of other, non-video training resources.
BEST PRACTICES	Information on the Navy's Best Practices" document initiative.
NFESC RECOMMENDED PRACTICES	An NFESC document listing recommended practices for various types of shore-based DoD Fuel Operations.
NAVY SPILL PREVENTION POCs	A list of Navy spill prevention points of contacts (POCs).

To return to the Navigation Helper, click on the RED Navigation Helper button at the end of each section.



FLASH TRAFFIC!!!

17 Jul 2002	EPA REVISES SPCC REGULATION. All SPCC plans must be extensively revised by
	17 Feb 2003, and the new plan implemented by 18 Aug 2003.
17 Apr 2003	EPA EXTENDS COMPLIANCE DEADLINES. All SPCC plans must be extensively revised
_	by 17 Aug 2004, and the new plan implemented by 18 Feb 2005.



INTRODUCTION

This guide was created as an aid to personnel involved in the design, installation, operation, or maintenance of Petroleum, Oil, and Lubricant (POL) storage and transfer facilities.

It's intended to become a one-stop-shop for information on various aspects of spill prevention. We say "become" because we aren't there yet. This document will be updated regularly to add and update information and to fix bad web links (that go to an inappropriate page) and dead links (that no longer go anywhere).

The **Navigation Helper** acts as a listing of the types of information available here.

The **Navigation Helper** has hypertext links that give you direct access to the type of information you're looking for. And every section ends with a **Navigation Helper** button to get you back there. (This is our attempt to introduce into this MS Word 97 document a bit of the hyperlink capability that makes web sites the gold standard for the delivery of information. So why is this guide presented as a MS Word document instead of as a web site? Because under the Navy / Marine Corps Intranet (NMCI) initiative, web sites are software, and software is highly regulated—while simple MS Word documents can be distributed and shared freely.)

Note:

- Web sites change. If you find a bad link or dead link, please let us know.
- If a listed web link containing information you desire has gone bad, try the primary or root web site to which the link belongs, and manually navigate to the information you are seeking.

Send comments or suggestions to: NFESC (805) 982-1887.



NFESC SPILL PREVENTION RESOURCE GUIDE

FEDERAL REGULATIONS

	, ,		
SPCC Plans; AST Equipment Requirements	40 CFR 112 (Oil Pollution Prevention), sections 112.1-112.15: • 17 Jul 2002 revised rule in the Federal Register (in PDF)		
	 http://www.epa.gov/oilspill/pdfs/40cfr112.pdf EPA's short summary about the revised rule http://www.epa.gov/oilspill/spccrule.htm 		
	EPA's cross-reference between the sections of the new rule and the previous rule http://www.epa.gov/oilspill/spcccros.htm		
	EPA's Oil Spill Program page, which offers links to a variety of SPCC-related information http://www.epa.gov/oilspill		
	EPA's SPCC Guides page, which offers links to more SPCC-related information http://www.epa.gov/oilspill/spccguid.htm#brochure		
	Note: the latest version of the Code of Federal Regulations (CFRs) currently available on the web is July 2002, and it does NOT include this 17 Jul 2002 revision of 40 CFR 112.		
UST Equipment Requirements	40 CFR 280 (Technical Standards And Corrective Action Requirements For Owners And Operators Of Underground Storage Tanks (UST):		
	CFR (web version; offers all sections) http://www.access.gpo.gov/nara/cfr/cfrhtml 00/Title 40/40cfr280 00.html		
	CFR (PDF version; whole regulation in one file) http://www.epa.gov/swerust1/fedlaws/40cfr280.pdf		
	EPA's UST page, which offers links to a variety of UST-related information http://www.epa.gov/swerust1/fedlaws/cfr.htm		
Visible Sheen Rule	40 CFR 110 (Discharge of Oil):		
 1996 version (in PDF), which may or may not have been revised since have a GOVERNMENT single-click URL with a later version, let us http://www.usace.army.mil/inet/usace-docs/eng-pamphlets/ep200-2-3 			
	This is where you find that all it takes to be a "harmful" discharge is a sheen: 110.3(b).		



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FEDERAL DOCUMENTS

NAVY	ENVIRONMENTAL AND NATURAL RESOURCES PROGRAM MANUAL. NAVFAC Document: OPNAVINST 5090.1B. Latest version: 9 Sep 1999.		
	Chapter 9, Oil Management Ashore (in PDF) http://neds.nebt.daps.mil/Directives/5090/nine.pdf		
	Chapter 10, Oil and Hazardous Substance Spills (in PDF) http://neds.nebt.daps.mil/Directives/5090/ten.pdf		
	Chapter 16, Storage Tanks (in PDF) http://neds.nebt.daps.mil/Directives/5090/sixteen.pdf		
	SPILL PREVENTION GUIDANCE DOCUMENT. NFESC Document: USER GUIDE UG-2033-ENV. Latest Version: Oct 1998		
	• Table of Contents (offering access to each chapter and appendix) http://enviro.nfesc.navy.mil/ps/spillprev		
MARINE CORPS	ENVIRONMENTAL COMPLIANCE AND PROTECTION MANUAL. Marine Corps Document: MCO P5090.2A. Latest version: 10 Jul 1998.		
	Chapter 18, Underground Storage Tanks https://www.denix.osd.mil/denix/Public/Policy/Marine/5090.2A/ch17-18.html#Chapter%2018		
EPA	MUSTs FOR USTs: A SUMMARY OF THE FEDERAL REGULATIONS FOR UNDERGROUND STORAGE TANK SYSTEMS. EPA Document: EPA 510-K-95-002. Latest Version: Jul 1995.		
	Document (in PDF). http://www.epa.gov/swerust1/pubs/musts.pdf		
DEFENSE ENERGY SUPPORT CENTER (DESC)	ENVIRONMENTAL GUIDE FOR FUEL TERMINALS. DESC Document Latest Version: Dec 2002		
	• No web site; for hardcopy document or CD-ROM, contact DESC-FQ at (703) 767-8313.		



ELEMENTS OF AN SPCC PLAN

Certain elements are common to any SPCC plan. In general, they can be broken into three categories:

- DATA PRESENTATION. Certain data must be provided on each tank, and other types of data must be provided for the entire facility (e.g., in a diagram) and on sets of tanks in a common secondary containment area (e.g., common containment and its drainage).
- PROCEDURE DESCRIPTIONS. The facility's procedures for performing various functions must be described.
- MANAGEMENT ISSUE ADDRESSING. Various management-level issues must be addressed.

Key elements involving the presentation of data:

- FACILITY DIAGRAM.
- TANK/BULK STORAGE CONTAINER DATA (data for each tank).
- SECONDARY CONTAINMENT DATA (data for each tank).
- OVERFILL PREVENTION AND CATCHMENT DATA (data for each tank).
- CORROSION PROTECTION DATA (data for each tank).
- TANK SUPPORT DATA (data for each tank).
- TANK SECURITY DATA (data for each tank).
- TANK PIPING DATA (data for each tank).
- DELIVERY TO TANK DATA (data for each tank).
- OIL SPILL FLOW PREDICTION DATA (data for each tank).
- LOADING/UNLOADING AREA DATA (data for each tank truck or railroad tank car loading/unloading rack).

Key elements involving the description of procedures that are in place:

- TRANSFER PROCEDURE DESCRIPTION.
- INSPECTION REQUIREMENT DESCRIPTION.
- TESTING REQUIREMENT DESCRIPTION.
- PERSONNEL TRAINING DESCRIPTION.

Key elements involving management of the plan itself:

- FOLLOWS SEQUENCE OF 40 CFR 112.7, OR PROVIDES A CROSS-REFERENCE TO THAT SEQUENCE.
- CERTIFICATION BY PROFESSIONAL ENGINEER.
- REVIEW EVERY FIVE YEARS.
- APPROVAL OF MANAGEMENT.



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INDUSTRY STANDARDS

40 CFR 112 requires that your SPCC plan be prepared in accordance with "good engineering practice", which includes the consideration of applicable **industry standards**. The following are some of the key industry standards involving tanks and transfer operations.

Most NAVFAC Engineering Field Division (EFD) and Engineering Field Activity (EFA) personnel, plus NFESC personnel, currently have web-based access to the standards of numerous standard-issuing organizations through a contract that expires in 2003, but could be extended. While not all industry standards from all industry associations are available (e.g., relevant standards the Steel Tank Institute (STI) are absent), the following key tank standard organizations have numerous standards accessible through the contract:

- AMERICAN PETROLEUM INSTITUTE (API).
- NATIONAL FIRE PROTECTION ASSOCIATION (NFPA).
- UNDERWRITERS LABORATORY (UL).

This section closes with information on that contract.

ABOVEGROUND TANKS (ASTs).

TANK CONSTRUCTION, INSTALLATION, REPAIR, ETC.:

- API STANDARD 650 (8th Edition), WELDED STEEL TANKS FOR OIL STORAGE.
- API STANDARD 653 (1st Edition), TANK INSPECTION, REPAIR, ALTERATION, AND RECONSTRUCTION.

RELEASE PREVENTION:

• Planned Inspections per API 653 (cited above).

TANK CALIBRATION:

- API MANUAL OF PETROLEUM MEASUREMENT STANDARDS (Chapter 2, Tank Calibration).
- API STANDARD 2550, MEASUREMENT AND CALIBRATION OF UPRIGHT CYLINDRICAL TANKS.

TANK APPURTENANCES:

- Vents per:
 - API STANDARD 650 (cited above).
 - API STANDARD 2000, VENTING ATMOSPHERIC AND LOW-PRESSURE STORAGE TANKS: NONREFRIGERATED AND REFRIGERATED.



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- Grounding per:
 - NFPA 30, FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE.
 - NFPA 77, RECOMMENDED PRACTICE ON STATIC ELECTRICITY.
 - NFPA 780, STANDARD FOR THE INSTALLATION OF LIGHTNING PROTECTION SYSTEMS.

TANK ALARM SETTINGS:

• API RP 2350 (2nd Edition), OVERFILL PROTECTION FOR STORAGE TANKS IN PETROLEUM FACILITIES.

TANK DIKES:

• Requirements of NFPA 30 (cited above).

UNDERGROUND STORAGE TANKS (USTs).

EPA's Office of Underground Storage Tanks (OUST) web site has a page that lists dozens of industry standards applicable to USTs:

http://www.epa.gov/swerust1/cmplastc/standard.htm



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INFORMATION ON NAVFAC'S WEB-BASED ACCESS TO INDUSTRY STANDARDS.

CONTRACT LIMITATIONS:

- CAN BE USED ONLY ON NAVFAC-RELATED PROJECTS. You may view, print, download, and save standards only for use on NAVFAC-related projects.
- ACCESS AVAILABLE ONLY AT EFDs, EFAs, AND NFESC (PLUS SAME-CITY ROICC OFFICES).
 There was only enough funding to supply access to the NAVFAC Headquarters, EFDs, EFAs, and NFESC (plus Resident Officer in Charge of Construction (ROICC) offices located in the cities of those NAVFAC components).
- CAN BE USED ONLY BY NAVFAC PERSONNEL. Usernames and passwords can't be given to contractors or other unauthorized personnel. Documents accessed under the contract can't be given to contractors or other unauthorized personnel.
- NO MORE THAN FIVE SIMULTANEOUS USERS ARE ALLOWED. If you can't access a site, it may be that it is already being used by five NAVFAC users rather than the site being overloaded in general. Try again later.

CONTRACT SCOPE:

The contract includes the following organizations (limitations in some cases; not all are publications available):

AGA	American Gas Association
ANSI	American National Standards Institute (Electrical/Electronics Section Only)
API	American Petroleum Institute
	(a) API Transportation, Marketing and Safety
	(b) API Exploration and Production
	(c) API Refining
ARI	Air Conditioning and Refrigeration Institute
ASHRAE	American Society of Heating, Refrigeration and Air-conditioning Engineers
ASME	American Society of Mechanical Engineers (ASME Standards Only)
ASTM	American Society for Testing and Materials
	(a) ASTM Metals Section
	(b) ASTM Construction Section
	(c) ASTM Rubber and Electric Insulating Materials
	(d) ASTM General Test Methods
	(e) ASTM Plastics Section
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builder Hardware Manufacturers Association
ICC	International Code Council
IEEE	Institute of Electrical & Electronics Engineers (Power Section Only)
IESNA	Illuminating Engineering Society of North America
MSS	Manufacturers Standardization Society (Valves and Fittings Standards)
NACE	National Association of Corrosion Engineers
NEMA	National Electrical Manufacturers Association
SSPC	Society for Protective Coatings
UL	Underwriters Laboratories (Complete without directories)
EURO	European Harmonized Standards



Department of Defense Adopted Industry Standards NATO Documents

The contract also includes access to commercial catalogues and GSA data via Catalog Express (CATX).

ACCESS THE CONTRACT'S RESOURCES:

1) To access the service, go to the Information Handling Services Engineering Resource Center (IHS ERC) web site at:

http://www.ihserc.com

Bookmark the page.

- 2) Click on the "Login" button on the left of the screen.
- 3) Select:
 - "Specs & Standards" for standards.
 - "CatalogXpress" for the commercial catalogues.
- 4) Each time the contract is accessed, the location of the computer is logged. Log in your username and password. Except for Charleston and Pensacola, which have pre-existing passwords, all other NAVFAC users must login using the following user name and password: The Username and Password are limited to the use of NAVFAC who has the actual Username and Password.

<u>Username</u>: <u>Password</u>:

For further information, contact your EFD, EFA, NFESC, or ROICC personnel who have access to this resource.

- 5) Log off when you are finished if you are not accessing anything for a few minutes. Remember, only five NAVFAC users can be on at one time. Please be considerate.
- 6) NOTE: For organizations that we only have limited access to, the PDF icon will be RED for allowed document access and BLACK for unavailable documents.

IF YOU NEED ASSISTANCE:

- IHS has both on-line help at <u>custsvc@ihs.com</u> and telephone help by calling (800) 447-3352. You will need to provide NAVFAC's Account Number: 7838506.
- Training for the new online IHS subscription is being planned.



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LEVEL SENSING

INTRODUCTION: The most basic concept in spill prevention is knowing the liquid level inside a tank. Level determining sensors can be categorized either by the size of tank (smaller, shop-fabricated tanks versus larger, field-constructed tanks) or by whether they require electrical power. In practice, smaller, shop-built tanks typically have unpowered devices (e.g., float gauges), whereas larger, field-constructed tanks typically have more sophisticated powered devices (e.g., ultrasonic instruments) that couple with sophisticated electronic alarm and control systems, due to the greater risk their volumes pose to the environment.

WHAT'S IN THE FIELD: Unpowered devices fall into two categories: float gauges and differential pressure gauges. Powered devices fall into four categories based on the physical principle(s) used to detect the liquid level in the tank: ultrasonic, radar, magnetorestrictive, and electro-optical.

WEB SITES OF SOME MAJOR LEVEL SENSING EQUIPMENT MANUFACTURERS:

- FLOAT GAUGES
 - Morrison Bros.

http://www.morbros.com/ast.htm

- Morrison Bros.

http://www.morbros.com/PDF/Fliers/1018flyer.pdf

- DIFFERENTIAL PRESSURE GAUGES
 - Barton Instrument Systems / Prime Measurement Products (find "Differential Pressure Instruments" or "Sealed Sensor Systems")
 http://www.barton-instruments.com
- ULTRASONIC LEVEL DEVICES
 - Barton Instrument Systems / Prime Measurement Products (find "Inventory Management Systems"
 DataScan products)

 http://www.barton-instruments.com
- RADAR DEVICES
 - Barton Instrument Systems / Primer Measurement Products (find "Inventory Management Systems"
 TankScan products)

 http://www.barton-instruments.com
- _____
- MAGNETORESTRICTIVE PROBES
 - Xerxes (inquire about "Gauging and Leak Detection Systems")
 http://www.xerxescorp.com

- Veeder-Root

http://www.veeder.com/dynamic/index.cfm?PageID=140

- ELECTRO-OPTICAL DEVICES
 - Xerxes (inquire about "Gauging and Leak Detection Systems")

http://www.xerxescorp.com

- Scully Signal (systems)

http://www.scully.com/ss estorage.html



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OVERFILL PREVENTION

INTRODUCTION: Unpowered gauges are passive; they do nothing but allow the fuel operator to watch them and require the operator to recognize when to manually stop the flow of fuel. This type of overfill prevention is allowable only for ASTs within secondary containment. It is not acceptable either for USTs or for ASTs whose only secondary containment is built-in (since built-in containment only prevents leaks, and does not provide overfill protection).

An active overfill prevention device involves some type of action, either to alert the fuel operator with an audible alarm (and sometimes also a light), or to act independently by shutting off fuel flow. This type of overfill prevention is mandatory for USTs and for ASTs not within conventional secondary containment.

Active devices, can also be basically categorized as unpowered devices (e.g., fill limiters and automatic shutoff delivery nozzles) for smaller, shop-fabricated tanks, and powered devices for larger, field-constructed tanks (typically part of sophisticated alarm and control systems).

WHAT'S IN THE FIELD: Shop-fabricated ASTs and USTs that aren't part of a fuel farm typically use unpowered devices. These are usually either fill limiters (installed in the fill tube, they have a float that mechanically shuts off flow), also called automatic shut-off devices; or in older tanks, ball float valves (with a floating ball that seals the vent when the tank is near full, pressurizing the tank and creating back pressure noticeable to the fuel operator). In addition to tank equipment, fuel trucks may be equipped with automatic shutoff nozzles for use with gravity-filled tanks (they function like nozzles in commercial filling stations).

Tank farm tanks and field-constructed tanks typically have powered liquid level determination devices that couple with sophisticated alarm and control systems.

WEB SITES OF SOME MAJOR OVERFILL PREVENTION EQUIPMENT MANUFACTURERS:

- ALARM SYSTEMS
 - Barton Instrument Systems / Prime Measurement Products (find "Inventory Management Systems"
 DataScan, TankScan, and other products)
 http://www.barton-instruments.com
 - Morrison Bros.

http://www.morbros.com/ast.htm

- Morrison Bros.
 - http://www.morbros.com/PDF/Fliers/1018flyer.pdf
- Xerxes (inquire about "Gauging and Leak Detection Systems")

http://www.xerxescorp.com

- Veeder-Root (Guardian monitoring system)
 - http://www.veeder.com/dynamic/index.cfm?PageID=91
- Veeder-Root (various monitoring systems)
 - http://www.veeder.com/dynamic/index.cfm?PageID=112
- Scully Signal (systems)
- http://www.scully.com/ss_estorage.html
- ALARM ANNUNCIATORS
 - Xerxes (inquire about "Gauging and Leak Detection Systems" and "Remote Annunciators")
 http://www.xerxescorp.com
 - Veeder-Root (light and horn)

http://www.veeder.com/dynamic/index.cfm?PageID=114



- HIGH-LEVEL SWITCHES
 - Barton Instrument Systems / Prime Measurement Products (find "Inventory Management Systems" DataScan products)

http://www.barton-instruments.com

- Veeder-Root

http://www.veeder.com/dynamic/index.cfm?PageID=93

- FILL LIMITERS (GRAVITY-FILL TANKS W/TIGHT FILL)
 - OPW (inquire about float-operated and venturi-operated USTs) http://www.opw-fc.com
- FILL LIMITERS (PRESSURE-FILL TANKS)
 - Clay & Bailey (find "Aboveground Storage Tank Equipment") http://www.claybailey.com
 - Morrison Bros.

http://www.morbros.com/ast.htm

- NOZZLES WITH AUTOMATIC CUT-OFFS (GRAVITY FEED)
 - OPM (find "Automatic Nozzles & Accessories" or "Manual Nozzles & Accessories") http://www.opw-fc.com



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LEAK DETECTION (DOUBLE-WALLED ASTs)

INTRODUCTION: Double-walled tanks are now very popular for the secondary containment they automatically provide, but besides not providing protection from overfills, there is the problem of how to determine when a leak has occurred in the interstitial space between the inner tank and the outer tank walls (or if someone has accidentally tried to deliver fuel into a vent of the interstitial space).

WHAT'S IN THE FIELD: Many tanks get by with having the fuel operator sniff a vent of the interstitial space (although this is not a recommended or preferred method of leak detection). Some tanks have small liquid sensors that are snaked through an interstitial space access opening down beneath the inner tank; they connect to some external, powered alarm and control system. Other ASTs have a low-point valve that can be opened for visual detection of any leaked fluid, or a dip-stick that reaches the bottom of the interstitial space. Some underground tanks, particularly in areas with a high groundwater table, have a brine-filled interstitial space and a brine reservoir that is monitored for a change in level (indicating either a leak of brine into the inner tank, a leak of brine out of the outer wall, or groundwater intrusion through the outer wall has occurred).

WEB SITES OF SOME MAJOR LEAK DETECTION EQUIPMENT MANUFACTURERS:

- INTERSTITIAL BRINE LEVEL MONITORING
 - Xerxes (inquire about "Gauging and Leak Detection Systems")
 - http://www.xerxescorp.com
 - Veeder-Root

http://www.veeder.com/dynamic/index.cfm?PageID=95

- INTERSTITIAL LIQUID DETECTION
 - Xerxes (inquire about "Gauging and Leak Detection Systems") http://www.xerxescorp.com
 - Veeder-Root (steel tank)
 - http://www.veeder.com/dynamic/index.cfm?PageID=175
 - Veeder-Root (fiberglass tank)
 - http://www.veeder.com/dynamic/index.cfm?PageID=100
 - Veeder-Root (smaller sensor)
 - http://www.veeder.com/dynamic/index.cfm?PageID=109



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GAS STATION DEVICES (for DAMAGE MITIGATION)

INTRODUCTION: Gas stations have special problems due to potential damage by vehicles. The most common mishap is for a forgetful customer to drive off with the nozzle still in their gas tank. Less common are collisions, where a vehicle rams a pump.

WHAT'S IN THE FIELD: "Drive-away" spills are minimized by breakaway devices, typically in the hose, but sometimes at the nozzle or at the pump, that have a valve on each side of the break point to retain the fuel on each side (both the driving-away end and the left-behind end). Collision-related spills are minimized by having a shear valve at the base of the pump to shut off fuel to the pump. A fire valve at the base of the pump similarly shuts off fuel to the pump if heat melts the part holding the spring-loaded fire valve open.

WEB SITES OF SOME MAJOR GAS STATION EQUIPMENT MANUFACTURERS:

- BREAKAWAYS (HOSE/NOZZLE/PUMP)
 - OPM (find "Swivels & Breakaways", "Automatic Nozzles and Accessories", or "Manual Nozzles and Accessories")

http://www.opw-fc.com

- Morrison Bros. (hose breakaways)
 http://www.morbros.com/service_station.htm
- IMPACT VALVE/SHEAR VALVE
 - Morrison Bros.

 $\underline{http://www.morbros.com/PDF/Spec\%20Sheets/fig636.pdf}$

- FIRE SHUT-OFF VALVE
 - Morrison Bros.

http://www.morbros.com/PDF/Spec%20Sheets/fig636.pdf



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LOADING RACK DEVICES (for SPILL PREVENTION)

INTRODUCTION: Tank trucks are simply mobile ASTs, and both overfills and hose disconnection spills are a serious problem associated with tanks trucks at loading racks.

WHAT'S IN THE FIELD: Dry-disconnection fittings at the hose-truck connection have become standard. Most tank trucks now use the safer bottom-loading method. Overfill prevention systems involve the coupling of overfill detection devices in the tank compartments of the truck with a control system of the loading rack that automatically shuts off fuel delivery.

WEB SITES OF SOME MAJOR TANK TRUCK EQUIPMENT MANUFACTURERS:

- BOTTOM-LOADING EQUIPMENT
 - Scully Signal (loading rack systems)

http://www.scully.com/ss_eterminal.html

- Scully Signal (tank truck systems)
 - http://www.scully.com/ss_etank.html
- Emco Wheaton (petroleum loading arms)
 - http://www.emcowheaton.com/loadingarms/loading arms.asp
- Timm Elektronik (bottom-loading systems)

http://www.timm-elektronik.de/en/Products/EUS-1/page11899.html

- DRY-DISCONNECTION FITTINGS:
 - OPW
 - http://www.opw-es.com/geninfo3.htm
 - Emco Wheaton (API bottom-loading couplers)
 - http://www.emcowheaton.com/loadingarms/loading_arms.asp
 - Scully Signal (Scul-Lock camlock fittings)
 - http://www.scully.com/ss_cgroove.html



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ADDITIONAL INFORMATION ON THE STATE OF THE ART

INTRODUCTION: The state of the art in tanks and applicable standards needs to be considered, not just the auxiliary devices (i.e., appurtenances) installed on tanks.

WHAT'S IN THE FIELD: New installations of ASTs tend to be either double-walled or diked tanks (a wall around the lower half of the tank). Catchment around fill inlets is now standard.

WEB SITES OF SOME MAJOR TANK STANDARD-SETTERS WITH INFORMATION ON THE STATE OF THE ART:

- STEEL TANK INSTITUTE (STI)
 - Tank Talk Newsletter http://www.steeltank.com/library/tanktalk/Default.htm
- NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
 - Current Codes/Standards http://www.nfpa.org/catalog
- NATIONAL GOVERNORS' ASSOCIATION CENTER FOR BEST PRACTICES
 - State Programs on Aboveground Storage Tanks and Inland Oil Spill Prevention http://www.nga.org/special/1,1260,C_MINI_WEB_SITE% 5ED_441,00.html



NFESC SPILL PREVENTION RESOURCE GUIDE

SPILL PREVENTION TRAINING (VIDEOS)

INTRODUCTION: The SPCC regulation, 40 CFR 112, has vague minimum requirements for the training of fuel operators. Videos are a means of fulfilling that need.

WHAT'S IN THE FIELD: Not much. The available videos tended to be aimed at initial training on spill prevention and the SPCC regulation. The real need –yet unserved– is <u>continuing</u> education for working fuel operators that reinforces and broadens their understanding of how spills happen, how equipment helps prevent spills, how their actions help prevent spills, and how the regulatory environment is changing the way tanks must be managed.

WEB SITES FOR VIDEOS DESIGNED TO FULFILL THE BASIC TRAINING REQUIREMENT OF THE SPCC REGULATION:

- Icon Training Materials of Iowa: http://www.icontraining.com/safeproduct/hazwaste.htm
- American Society of Civil Engineers (ASCE): http://www.asce.org/conted/distancelearning/environmental.cfm
- ABS Consulting:

http://www.govinst.com/Merchant2/merchant.mv?Product_Count=4&Screen=PROD&Store_Code=ACS&Product_Code=085-VIDEO&Category_Code=TRAINVIDEOITEM

WEB SITES FOR VIDEOS SPECIFICALLY ON SPILL PREVENTION:

- "Oil Spill Prevention Ashore/Awareness for Fuel Operators": (a humorous presentation of some DOs and DON'Ts)
- "Oil Spills in Port Prevention": (a series of potential spill scenarios aboard a ship)

Both of the above videos are available free from the Defense Visual Information Center. The following link and the directions enable any government employee to order a VHS video from the Defense Visual Information Center (DVIC) at no cost.

http://www.dodmedia.osd.mil/dvic

- -Click on AFIS Products
- -Training Tapes/CD-ROM Search
- -In the search box type "spill prevention" with "all the terms" box checked
- -And it will bring up a list of videos
- -Click on the video title link
- -Click on "Add Item to Shopping Cart"
- -Click on "Check Out"
- -Type in your information (name, address, etc.)
- -Click on Order



NFESC SPILL PREVENTION RESOURCE GUIDE

WEB SITES FOR VIDEOS THAT CONTAIN SOME INFORMATION ON SPILL PREVENTION:

- "Environmental Guide The Video": available from DESC (covers the use of the DESC Environmental Guide for Fuel Terminals). No web site; for hardcopy document or CD-ROM contact DESC-FQ at (703) 767-8313.
- Overseas Marketing Group (OMG): Spill Prevention and Control video series. http://www.omgsic.com/hazardous_safety.htm



NFESC SPILL PREVENTION RESOURCE GUIDE

SPILL PREVENTION TRAINING (OTHER)

NON-VIDEO TRAINING:

- ADVANCED ENVIRONMENTAL MANAGEMENT COURSE:
 STORAGE TANKS is just one topic covered in this course, which covers many key points on spill prevention.
 Civil Engineering Corps Officers School (CECOS) in Port Hueneme, California.
 https://www.cecos.navy.mil
- "OIL SPILL PREVENTION STAND DOWN": This MS PowerPoint presentation was created by DESC to train their fuel operators (i.e., an actual classroom course).



NFESC SPILL PREVENTION RESOURCE GUIDE

BEST PRACTICES (INTRODUCTION)

The Navy has contracted with Booz Allen Hamilton to create a Best Practices document.

Their web site is password-protected, and is currently only available to Petroleum Compliance & OHS Spill Management Media Field Team Members: http://commnet.bah.com (under Interative Library, find Best Practices).



NFESC SPILL PREVENTION RESOURCE GUIDE

NFESC RECOMMENDED PRACTICES

This section presents a working document being maintained by NFESC.

NFESC RECOMMENDED PRACTICES FOR DOD FUEL OPERATIONS (SHORE-BASED)

INTRODUCTION

The Clean Water Act of 1972 introduced the broad concept of "Best Management Practices", referring to industry-specific operational guidelines for preventing releases of hazardous substances. While none of the Environmental Protection Agency (EPA) oil spill regulations incorporates this concept (i.e., gives it a definition and mandates its use), there is a need for an equivalent document for the Department of Defense (DOD) fuel operations "industry".

Because the term "Best Management Practices" has special EPA-related implications, and because the Navy has contractor Booz Allen Hamilton creating "Best Practices", we instead use the term "NFESC Recommended Practices". We include our name because this document currently has no higher sanction, and because some areas of "best" practices may be open to debate (for example, the wisdom of using float ball valves as overfill prevention devices for underground storage tanks). While we consulted with many other organizations, we bear the ultimate responsibility for this document. Therefore the recommendations are NFESC's.

We use the term "practices" loosely. It incorporates various concepts, programs, rules, standard operating procedures (SOPs), techniques, methods, etc. For example, "maintain good housekeeping" is a worthy practice in a generic sense, but we really need to address the specifics of meeting that requirement—and those will vary by type of operation and even by facility.

For aboveground storage tanks (ASTs), these practices technically apply only to those regulated under the EPA's Spill Prevention, Control, and Countermeasure (SPCC) regulation (40 CFR 112). We urge, however, that all ASTs be equipped and operated to meet those requirements.

For underground storage tanks (USTs), these practices technically apply only to those regulated under the EPA's UST regulation (40 CFR 280). We urge, however, that all USTs be equipped and operated to meet those requirements.

PURPOSE

This document compiles Recommended Practices regarding fuel spill prevention and mitigation at DOD fuel facilities. It provides guidance relating to the equipping, operating, and maintaining of fuel storage and transfer facilities, both stationary and mobile.

Some of these practices vary depending on whether the equipment is a new installation or already in place. Like the EPA's UST requirements that took effect in 1998, new equipment standards are higher than the standards for existing equipment (whose retrofitted might be prohibitively expensive).

We expect this document's greatest utility to be as a central, web-based source of information on fuel spill prevention practices. For example, DOD organizations and facilities updating fuel facility operations manuals will be able to look for new ideas and easily cut-and-paste anything of interest.



NFESC SPILL PREVENTION RESOURCE GUIDE

ORGANIZATION

Some practices apply to fuel operations in general, but many types of fuel operations have their own unique spill prevention challenges. The first section presents Recommended Practices for operations in general, followed by sections for each of the following types of operations:

- USTs FILLED BY TANK TRUCK.
- ASTs FILLED BY TANK TRUCK.
- LOADING RACKS/TANK TRUCKS.
- USED OIL TANKS.
- TANK FARMS (includes all tanks filled via pipeline).
- GAS STATIONS.
- AIRCRAFT REFUELING.

GENERAL OPERATIONS RECOMMENDED PRACTICES

NFESC RECOMMENDED PRACTICES:

- EQUIPMENT SPECIFICATION (SPILL PREVENTION LEVEL). Fuel facilities should consider the legal requires of EPA, state, and local regulations to be the <u>minimum</u> levels of spill prevention needed, not the maximum.
- EQUIPMENT SPECIFICATION (POTENTIAL FOR HUMAN ERROR). Fuel facilities should choose equipment that minimizes the potential for human error. Murphy's Law is alive and well. Choose the dry-disconnection couplings with the safety interlocks. Choose the automatic fill limiters. Choose to install a fill inlet catchment tub on every tank.
- LEAKS. Leaks (in hoses, piping, tanks, etc.) should be repaired as soon as possible. Small leaks of tiny quantities become significant quantities over time. They also signal the potential for equipment failures that could result in larger spills.

USTs FILLED BY TANK TRUCK RECOMMENDED PRACTICES

SPILL TYPES COMMON TO USTs FILLED BY TRUCK:

- OVERFILLS. The root causes are either the fuel operator not knowing the level in the tank, or failure of automatic fill limiters or alarms. These USTs are typically shop-fabricated and reliant on automatic fill-limiter devices or alarms that signal the operator to stop delivery (as opposed to gauges).
- PRESSURE-FILL DISCONNECT SPILLS. Pressure fills involve a camlock coupling (or other positive, sealed connection) of the truck hose to the tank inlet, and some amount of fuel is always released at disconnection.
- RUST-OUT. For single-walled, metallic USTs, the most common failure is rust-out due to inadequate corrosion protection.

NFESC RECOMMENDED PRACTICES:

- USTs NOT COVERED UNDER 40 CFR 280. USTs exempted from 40 CFR 280 should be equipped to meet those standards. (The only exempted class of particular significance to DOD fuel facilities is USTs for heating oil consumed on the premises.) Note that USTs exempted from 40 CFR 280 are regulated by 40 CFR 112.
- FILL LIMITS. Facility policy **must** set a fill limit of no more than 90% of tank capacity. Facilities should consider setting lower fill limits for higher-risk tanks, for example, tanks beside water bodies.
- FILL INLET CATCHMENT BASINS. UST fill inlets **must** be equipped with a catchment basin/tub. (This has been a mandatory EPA requirement since 1998.)
- OVERFILL PREVENTION DEVICES (NEW INSTALLATIONS). New USTs **must** have either an automatic shutoff device (e.g., fill limiter) or a high-level alarm. (This has been a mandatory EPA requirement since 1998, though float ball valves are technically allowed.)



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- OVERFILL PREVENTION DEVICES (EXISTING INSTALLATIONS). Existing USTs **must** have either an automatic shutoff device (e.g., fill limiter) or a high-level alarm or a float ball valve. (This has been a mandatory EPA requirement since 1998.) Use of float ball valves is not a recommended practice; the next time the tank top is uncovered, the float ball valve should be removed, and the UST retrofitted with a fill limiter or high-level alarm. (Referring to float ball valves, the EPA advises "Most tanks can safely withstand pressures of only 5 psi, and flow restrictors may allow a much higher pressure to develop during pressurized delivery, causing tanks to rupture." (See Section IV(C)(1)(c) of the Preamble to the EPA UST regulation, 40 CFR 280, published in the Federal Register on 23 Sep 1988.)) (California Local Guidance letter 150 (LG 150) strongly discourages the use of ball float valves, regardless of whether the tank is pressure-filled.)
- CORROSION PROTECTION (NEW INSTALLATIONS). New USTs and their piping must be either made of
 non-corrodible material (e.g., fiberglass); or have both a corrosion-resistant coating AND cathodic protection;
 or be clad with a thick, non-corrodible material (applies to tank only). (This has been a mandatory EPA
 requirement since 1998.)
- CORROSION PROTECTION (EXISTING USTs). Existing USTs not meeting new-installation standards **must** be equipped with either cathodic protection or an interior lining of thick, non-corrodible material (or a combination of the two). (This has been a mandatory EPA requirement since 1998.)
- CORROSION PROTECTION (PIPING). Underground steel piping **must** have cathodic protection unless encased in non-corrodible material. (This has been a mandatory EPA requirement since 1998.)
- CATHODIC PROTECTION MAINTENANCE. Sacrificial anode systems **must** be inspected by a qualified inspector at least every three years. Impressed current systems **must** be tested every 60 days. (This has been a mandatory EPA requirement since 1998.)
- LEAK DETECTION. USTs must somehow meet the leak detection requirements that have been mandatory since 1998.

ASTs FILLED BY TANK TRUCK RECOMMENDED PRACTICES

SPILL TYPES COMMON TO ASTs FILLED BY TRUCK:

- OVERFILLS. The root cause is the fuel operator not knowing the liquid level in the tank. These ASTs are typically shop-fabricated and reliant on the operator monitoring the liquid level and manually stopping the fuel delivery (as opposed to having automatic fill limiter devices or alarms).
- PRESSURE-FILL DISCONNECT SPILLS. Pressure fills involve a camlock coupling (or other positive, sealed connection) of the truck hose to the tank inlet, and some amount of fuel is always released at disconnection.
- SECONDARY CONTAINMENT INADEQUACIES. Spilled fuel contained in berm-type secondary containment can be released into the environment if the containment has: 1) insufficient capacity, 2) poorly maintained sealant in cracks, joints, and seams, 3) sealant that can be dissolved by fuel, or 4) an open drain valve.
- RUST-OUT. For single-walled ASTs, the most common failure resulting in a spill is bottom rust-out due to the water that accumulates in the bottom of the tank.
- ACCIDENTAL FILLS OF INTERSTITIAL SPACE. Occasionally inexperienced fuel operators fill into an opening of the interstitial space of an AST with built-in containment, and an overfill happens very quickly.

NFESC RECOMMENDED PRACTICES:

• TANK TYPE (NEW INSTALLATIONS). Double-walled or self-diked ASTs should be chosen, since these will not require berm-type secondary containment. EPA policy allows shop-fabricated ASTs with built-in containment to be considered to provide equivalent protection to berm-type secondary containment, if they installed and operated with certain protective measures (refer to Memorandum, undated, from the EPA (Office of Solid Waste and Emergency Response) to Oil National Policy Managers, EPA Regions 1 – 10: "Use of Alternative Secondary Containment Measures at Facilities Regulated under the Oil Pollution Prevention Regulation (40 CFR Part 112)", available on the internet at [http://www.epa.gov/oilspill/pdfs/contain.pdf]). These un-bermed double-walled tanks must be equipped with an advanced overfill prevention device (e.g., fill limiter or high-level alarm, not just a gauge) AND be constantly monitored during filling.



NFESC SPILL PREVENTION RESOURCE GUIDE

- FILL LIMITS. Facility policy **must** set a fill limit of no more than 90% of tank capacity. Facilities should consider setting lower fill limits for higher-risk tanks, for example, tanks beside water bodies.
- OVERFILL PREVENTION DEVICES. ASTs should have gauges; manual observation is an inadequate practice. Double-walled or self-diked tanks not within berm-type secondary containment **must** be equipped with either an automatic fill limiter or a high-level alarm system. Automatic fill limiters should be standard equipment for all ASTs.
- GAUGE INSTALLATION. Gauges **must** be properly installed, which includes avoiding damage during installation and orienting mechanisms with swing-up floats so that they won't be obstructed by walls or internal members.
- GAUGE VISIBILITY. Gauge readouts **must** be easily readable by the fuel operator from the operator's normal position during filling. This readability requires proper orientation of the readout, sufficient size of the readout, and replacement of plastic housings that have become cloudy due to exposure to the elements.
- GAUGE ACCURACY. Gauges **must** be tested "periodically" and either repaired or replaced before the next filling if they fail to meet some facility-prescribed percentage of accuracy. (Common sense dictates that if a facility's standard fill limit is 90% of tank capacity, the facility shouldn't allow a gauge that's 10% off.)
- GAUGE ACCOUNTABILITY. A fuel operator **must** inform fuel facility management if a gauge becomes damaged, hard to read, or appears to be inaccurate (for example, if it reads half full when the tank is completely full). Management **must** insure that any such gauge is repaired or replaced before the next filling. Fuel facility operations manuals should adopt a written policy of not filling any tank without a properly functioning gauge; getting by can no longer be tolerated.
- FILL INLET CATCHMENT BASINS (PRESSURE-FILLED ASTs). Pressure-filled AST fill inlets should be equipped with a catchment basin/tub to catch disconnection spills.
- SECONDARY CONTAINMENT SIZE. Berm-type secondary containments **must** hold at least 110% of the volume of the largest tank within the containment (or tank set, if they are manifolded to supply as single unit).
- SECONDARY CONTAINMENT MAINTENANCE. Sealant in all cracks, joints, and seams in flooring, curbing, etc. **must** be impervious to fuel and **must** be maintained so that the containment is fuel-tight at all times.
- SECONDARY CONTAINMENT DRAINAGE. Accumulated rainwater **must** be inspected for sheen prior to release. Release **must** be via a manual valve or manually-activated pump; automatically-activated pumps are forbidden. Drainage valves **must** be locked except when draining. (Note: the sole purpose of secondary containment is to contain a spill –its very existence assumes a spill so knowingly leaving a drain valve open or partially open could be construed as a "knowing" violation of the Clean Water Act if that planned-for spill occurred and reached a water body through that valve.)
- AST PLACARDS. ASTs should be placarded with key tank information. General information should include fuel type, total capacity, tank ID number, and tank management system bar code. A simple diagram will illustrate tank shape and configuration (e.g., double-walled), measurements of (inner) tank, fill limit percentage, fill limit in gallons, etc. A strapping chart will include an appropriate number of measure points from zero inches to height / diameter inches.
- AST FILL INLET IDENTIFICATION. Fill inlets should be clearly identified (e.g., with stenciled "INLET" and stenciled arrow).

LOADING RACKS/TANK TRUCKS RECOMMENDED PRACTICES

SPILL TYPES COMMON TO LOADING RACKS:

- DISCONNECTION SPILLS (NORMAL). Some fuel is spilled with every disconnection. Those spills need to be contained and their quantity minimized.
- DISCONNECTION SPILLS (ACCIDENTAL). Some hose/truck couplings lack an interlock to prevent the coupling from being disconnected if the truck's receiving valve is still open. These are subject to operator error resulting in spills.
- OVERFILLS OF TANK TRUCKS. Tank trucks are just mobile tanks that can be overfilled like any other tank.



- HOSE/TRUCK COUPLING MALFUNCTIONS. The upstream-side (loading rack) fitting of a dry-disconnection hose/truck coupling has a spring-loaded valve that can leak or fail. The downstream-side (truck) fitting has a manual valve that can leak. (Note: the term Dry-Break is the trademarked brand of Emco Wheaton dry-disconnect couplings. The generic term is "dry disconnect".)
- SECONDARY CONTAINMENT INADEQUACIES. If any of the above-mentioned spills occurs, it will be within the loading rack's secondary containment. However, fuel can be released into the environment if the containment has: 1) insufficient capacity, 2) poorly maintained sealant in cracks, joints, and seams, 3) sealant that can be dissolved by fuel, or 4) an open drain valve.

NFESC RECOMMENDED PRACTICES (NEW INSTALLATIONS):

- BOTTOM-LOADING. New loading racks **must** be bottom loading.
- AUTO-SHUTOFF OVERFILL PREVENTION SYSTEM. New loading racks **must** be equipped with a system that includes an auto-shutoff mechanism that interlocks with an overfill detection sensor in the truck compartment being filled. All tank trucks filling at the new loading rack **must** be retrofitted to be compatible.
- INTERLOCK-EQUIPPED DRY-DISCONNECTION COUPLINGS. New loading racks **must** be equipped with dry-disconnection hose couplings that interlock with truck couplings to prevent the truck's valve from being opened unless the coupling is fully connected.

NFESC RECOMMENDED PRACTICES (EXISTING INSTALLATIONS):

- UPGRADE TO NEW-INSTALLATION PRACTICES. Existing loading racks should be retrofitted to new-installation practices to the maximum extent practical.
- DRY-DISCONNECTION COUPLINGS. All loading racks should have dry-disconnection couplings of some kind. Any that don't should be retrofitted as soon as possible, preferably with an interlock-equipped type, and all tank trucks filling at a retrofitted loading rack **must** be retrofitted to be compatible.

NFESC RECOMMENDED PRACTICES (ALL INSTALLATIONS):

- COUPLING INSPECTION. Every time a fuel operator fills a tank truck, it **must** be standard operating procedure to observe whether either the hose coupling or the truck coupling is leaking.
- SECONDARY CONTAINMENT SIZE. Loading racks **must** provide secondary containment whose capacity is at least 110% of the volume of the largest compartment of any truck filled there.
- SECONDARY CONTAINMENT MAINTENANCE. Sealant in cracks, joints, and seams in flooring, curbing, etc. **must** be impervious to fuel and **must** be kept maintained so that the containment is fuel-tight at all times.
- SECONDARY CONTAINMENT DRAINAGE. Accumulated rainwater **must** be inspected for sheen prior to release. Release **must** be via a manual valve or manually-activated pump; automatically-activated pumps are forbidden. Drainage valves **must** be locked except when draining.

USED OIL TANKS RECOMMENDED PRACTICES

SPILL TYPES COMMON TO USED OIL TANKS:

• FILL INLET SPILLS. While all other types of fuel operations are performed by fuel operators, Navy or contracted, dumping and transferring used oil to used oil tanks is often done by non-fuel personnel (e.g., mechanics or remediation contractors) who have not been trained in spill prevention. Spills occur due to inadequate equipping (no fill inlet catchment), lack of concern, and lack of training.

NFESC RECOMMENDED PRACTICES:

- FILL INLET CATCHMENT BASINS/TUBS. Used oil tanks should be equipped with a catchment basin/tub to catch spills.
- FILL INLET FUNNELS. For used oil tanks without a fill inlet catchment basin/tub, a funnel must be used at all times.



- OPEN-TOPPED CONTAINERS (e.g., BUCKETS). Open-topped containers such as buckets should never be used to transfer used oil to a used oil tank. Use a container that can be closed instead.
- SPILL PREVENTION BRIEFING. All personnel authorized to dump or transfer used oil to a used oil tank **must** receive a spill prevention briefing specifically on the proper use of a used oil tank.

TANK FARMS RECOMMENDED PRACTICES

SPILL TYPES COMMON TO TANK FARMS:

• OVERFILLS. The root causes are either misalignment of valves (e.g., sending fuel to wrong tank) or the fuel operator not knowing the liquid level in the tank. Failure of high-level alarms (whether due to equipment failure or inattention on the part of the pump control operator) allows those operator errors to become overfills.

NFESC RECOMMENDED PRACTICES:

- FUEL TERMINAL OPERATIONS MANUAL. Distribution system valve line-up procedures provided in Fuel Terminal Operations Manuals can be used to prevent human error.
- MONITOR INVENTORY. There are ways to validate the total volume prior to filling, such as using stick or tape gauging methods.

GAS STATIONS RECOMMENDED PRACTICES

SPILL TYPES COMMON TO GAS STATIONS:

• DRIVE-AWAYS. Careless motorists drive away with the nozzle still in their gas tank, breaking away either the nozzle or the entire hose, and spilling a small amount of gasoline.

NFESC RECOMMENDED PRACTICES:

- NOZZLE LATCH REMOVAL. This requires the driver to man the nozzle at all times.
- PLACARDING. Installing signs to indicate that refueling must be attended at all times.

AIRCRAFT REFUELING RECOMMENDED PRACTICES

SPILL TYPES COMMON TO AIRCRAFT REFUELING:

- OVERFILLS. These are typically due to aircraft equipment malfunction and poor communication between the fuel operator at the aircraft and the operator at the tank truck controls.
- DISCONNECTION SPILLS. These are typically due to poor communication between the fuel operator at the aircraft and the operator at the tank truck controls; the hose is disconnected before the truck stops pumping or the aircraft receiving valve is closed.

NFESC RECOMMENDED PRACTICES:

- VENT CHECK. The fuel operator should check the fuel vent on the aircraft to ensure the vent is not blocked and is functioning correctly at the beginning of the fueling process.
- HOT PIT SITE OPERATION. Fuel operators must remain in the line of sight of the pilot, aircraft personnel, and other fuel operators, as necessary, to observe hand signals during hot pit site fueling operations where verbal or audible commands are difficult to hear.



NAVY SPILL PREVENTION POCs

NAVAL FACILITIES ENGINEERING SERVICE CENTER:

POC 1

Navy policy restricts the listing of names, phone numbers, and email addresses of personnel on the internet. Consequently the POCs included in this section have been removed from this on-line version of the guidance document. Contact NFESC at (805) 982-1887 in order to obtain Navy Spill Prevention POC information.

POC 2

POC 3

NAVAL FACILITIES ENGINEERING COMMAND:

HEADQUARTERS

POC 1



SOUTHERN DIVISION

POC 1

Navy policy restricts the listing of names, phone numbers, and email addresses of personnel on the internet. Consequently the POCs included in this section have been removed from this on-line version of the guidance document. Contact NFESC at (805) 982-1887 in order to obtain Navy Spill Prevention POC information.

POC 2

ATLANTIC DIVISION

POC 1

EFA CHESAPEAKE

POC 1

POC2



EFA NORTHEAST

POC 1

Navy policy restricts the listing of names, phone numbers, and email addresses of personnel on the internet. Consequently the POCs included in this section have been removed from this on-line version of the guidance document. Contact NFESC at (805) 982-1887 in order to obtain Navy Spill Prevention POC information.

SOUTHWEST	DIVISION
SOUTHWEST	DIVISION

POC 1

POC 2

EFA NORTHWEST

POC 1

POC 2



PACIFIC DIVISION

POC 1

Navy policy restricts the listing of names, phone numbers, and email addresses of personnel on the internet. Consequently the POCs included in this section have been removed from this on-line version of the guidance document. Contact NFESC at (805) 982-1887 in order to obtain Navy Spill Prevention POC information.

POC 2

NAVIGATION HELPER

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